

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
TYLER DIVISION**

BLUE SPIKE, LLC  
*Plaintiff,*

v.

TEXAS INSTRUMENTS, INC., et al.  
*Defendants*

§ Civil Action No. 6:12-CV-499 MHS  
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§ LEAD CASE  
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**DECLARATION OF KEVIN W. BOWYER, PH.D. IN SUPPORT OF**  
**DEFENDANTS' MOTION FOR SUMMARY JUDGMENT OF INVALIDITY ON THE**  
**BASIS THAT CLAIM TERMS ARE INDEFINITE**

I, Kevin W. Bowyer, Ph.D., do hereby state and declare:

1. I have personal knowledge of the facts stated in this Declaration and could testify competently to them if asked to do so.

2. I submit this Declaration in support of Defendants' Motion for Summary Judgment of Indefiniteness of United States Patent No. 7,346,472 (the "'472 patent"); United States Patent No. 7,660,700 (the "'700 patent"); United States Patent No. 7,949,494 (the "'494 patent"); and United States No. 8,214,175 (the "'175 patent") (collectively, the "Asserted Patents," or "patents-in-suit").

3. I have been asked to analyze and set forth my opinions on the indefiniteness of the term "abstract" that is recited in the claims of the Asserted Patents. This Declaration thus describes (i) my qualifications and related background information, (ii) my opinions with regard to the indefiniteness of the term "abstract," and (iii) the basis and reasons for these opinions. As set forth more fully herein, it is my opinion that the term "abstract," read in light of the common specification delineating the Asserted Patents, as well as their prosecution histories, fails to inform, with reasonable certainty, one of ordinary skill in the art about the scope of the alleged invention.

4. It is my understanding that discovery is ongoing in this case and that I may be asked by the Defendants to render additional opinions on the invalidity and/or non-infringement of the Asserted Patents, among other topics. As a result, I reserve the right to amend or supplement my opinions in light of evidence presented by Plaintiff Blue Spike, LLC ("Blue Spike"), in light of additional information that may be made available to me in the future, and in light of the fact that discovery in this case is ongoing and that expert disclosures have yet to occur.

**Expert Qualifications & Related Backgrounds**

5. I received my Ph.D. in Computer Science from Duke University in 1980 and my Bachelors degree from George Mason University in 1976. Currently, I am the Chair of the Department of Computer Science and Engineering at the University of Notre Dame. Prior to joining the University of Notre Dame, I held faculty positions in the Department of Computer Science and Engineering at the University of South Florida, in the Institute for Informatics at the Swiss Federal Technical Institute in Zurich, and the Department of Computer Science at Duke University.

6. My research and authorship has significantly focused in the fields of signal processing and biometric identification, the latter of which can generally be defined as the study of the ways in which human physiological and behavioral characteristics (such as a person's fingerprints, iris, face, and other immutable traits) can be used to verify identity. My curriculum vitae, which is attached to my Declaration as **Exhibit A**, lists my numerous published scientific papers relating to signal processing, biometric identification (including face recognition, iris recognition, and multi-modal biometrics), as well as other research interests.

7. In addition to the numerous publications and books described therein, I have received several awards for my contributions to signal processing, biometric identification, and related fields. For example, I have been elected as a Fellow of the International Association for Pattern Recognition ("IAPR"), a Fellow of the Institute of Electrical and Electronics Engineers ("IEEE"), and a Golden Core Member of the IEEE Computer Society. The citation for my advancement to IAPR Fellow reads: "for contributions to computer vision, pattern recognition and biometrics." The citation for my advancement to IEEE Fellow reads: "for contributions to algorithms for recognizing objects in images."

8. The Fellow level of membership in the IAPR and the IEEE is a competitive honor. By IAPR rules, the number of Fellows elected every two years cannot exceed one quarter of one percent of the total IAPR membership. Under the bylaws of the IEEE, the number of persons selected as Fellows in a given year cannot exceed one tenth of one percent of the total IEEE voting membership.

9. In 2014, I also received an IEEE Computer Society Technical Achievement Award, with the citation “for pioneering contributions to the science and engineering of biometrics.” The Technical Achievement Award is even more highly selective than IEEE Fellow, with only about one tenth as many persons receiving a Technical Achievement Award in a given year as are advanced to IEEE Fellow in a given year.

10. In addition to these awards, I have also held significant leadership positions with well-established periodicals in the fields of signal processing and biometric identification. In this respect, I served as Editor-In-Chief of the IEEE Transactions on Pattern Analysis and Machine Intelligence (“PAMI”). In the 2013 Journal Citations Report, PAMI was ranked as the #5 journal by Impact Factor over all of Electrical and Electronics Engineering, and is the top-ranked journal for biometrics-related research.

11. I also served as the inaugural Editor-In-Chief of the IEEE Biometrics Compendium. The Biometrics Compendium is the first IEEE “virtual journal,” which is a collection of previously published IEEE papers in specific scientific and technical disciplines. I also am currently serving on the editorial boards of IET Biometrics and IEEE Access, and have served on the editorial boards of a number of other journals.

12. Finally, I have also chaired several well-established biometrics and signal processing conferences. I currently serve as Session Chair of the Academic and Innovation

Track at the Biometrics 2014 conference to be held in London in October of 2014, General Chair of the 2015 IEEE International Conference on Biometrics Theory, Applications and Systems (“BTAS”) to be held in Washington DC in September of 2015, and as General Chair of the 2015 IEEE International Conference on Automated Face and Gesture Recognition to be held in Slovenia in May of 2015. I am also the founding General Chair of the BTAS conference series, having served as its General Chair in 2007, 2008 and 2009. I also served as General Chair of the 2011 International Joint Conference on Biometrics, Program Chair of the 2011 Automated Face and Gesture Recognition conference, and in various organizing capacities for numerous other conferences related to biometrics, pattern recognition, and computer vision.

13. I am being compensated at a rate of \$350 per hour for my work on this matter. My compensation in this matter is not in any way dependent on the outcome of the litigation.

**Legal Standards for Indefiniteness**

14. I have been informed about certain legal principles that are applicable to the opinions set forth in my Declaration. In particular, I have been informed that United States Patent Law requires that a patent specification “conclude with one or more claims *particularly pointing out and distinctly claiming* the subject matter which the applicant regards as [the] invention.” 35 U.S.C. § 112, ¶ 2 (pre-AIA) (emphasis added). It is my understanding that this requirement is known as the “definiteness requirement,” and that a claim that fails to meet this requirement is invalid for being “indefinite.”

15. I understand that a patent is indefinite if its claims, read in light of the patent’s specification and prosecution history, fail to inform, with reasonable certainty, one skilled in the art about the scope of the invention. It is also my understanding that this standard was

articulated by the United States Supreme Court in a recent decision, *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120 (2014). I am familiar with the *Nautilus* decision.

16. Consistent with this indefiniteness standard that has been established by the United States Supreme Court, it has been explained to me that indefiniteness is to be evaluated from the perspective of someone of ordinary skill in the relevant art at the time the patent was filed. I also understand that in assessing whether claims are indefinite, the claims must be read in light of the patent's specification and prosecution history. It is also my understanding that the scope of the claim language recited in a patent cannot depend solely on the unrestrained, subjective opinion of a particular individual purportedly practicing the invention. Rather, a patent must provide some objective standard in order to allow the public to determine the scope of the claimed invention.

17. It is my understanding that indefiniteness is a question of law to be decided by the Court. However, I also understand that the question of indefiniteness may sometimes depend upon factual findings, such as the knowledge and understanding of a person of ordinary skill in the art.

18. Finally, it is also my understanding that a patent claim is presumed to be valid as a matter of law. Counsel has explained to me that proof that a patent claim is invalid must be supported by clear and convincing evidence. I understand that clear and convincing evidence is a high burden of persuasion that requires a finding of facts that are highly and substantially more likely to be true than not, and that I must have a firm belief or conviction in the facts to support my conclusions. In this Declaration, I analyze the asserted claims of the patents-in-suit in light of this clear and convincing standard, and as explained herein, I am convinced that the term "abstract" is indefinite, thus rendering the Asserted Patents invalid.

**Level of Ordinary Skill in the Art**

19. I have also been asked to consider the level of a person of ordinary skill in the art at the time of the alleged invention recited in the Asserted Patents. Counsel has informed me that certain factors may be considered in determining the level of ordinary skill in the art at the time of the invention: (1) the type of problems encountered in the art; (2) prior art solutions to these problems; (3) the rapidity with which inventions are made; (4) the sophistication of the technology; and (5) the educational level of active workers in the field. I am also informed that a person of ordinary skill in the art is also a person of ordinary creativity, not an automaton.

20. As explained more fully below, it is my belief and opinion that the field of biometric identification and whatever may be legitimately covered by the patents-in-suit are distinct and separate areas with no amount of overlap. Thus, I do not agree with Blue Spike's incorrect claim that the patents-in-suit apply to the field of biometric identification. Nevertheless, should the patents-in-suit ultimately be determined to apply to the field of biometric identification, it is my opinion, based on my knowledge and experience, that a person of ordinary skill in that art at the time of the alleged invention of the patents-in-suit (i.e., by at least September 7, 2000, which I understand Blue Spike claims is the priority date of the patents-in-suit) would have been a person with at least a Bachelor's degree in Electrical Engineering, Computer Science, or an equivalent degree, with a background and at least two years' experience in the fields of signal or image processing, biometric identification, and/or related fields.

21. According to this definition, I qualified as a person of ordinary skill in the art by at least September 7, 2000, the date of the alleged invention recited in the Asserted Patents. As explained above and in Exhibit A to my Declaration, I had received my doctorate degree in Computer Science from Duke University by 1980, and had gained years of significant experience

in the fields of signal processing and biometric identification (and had also published multiple articles in those fields) well-before the time of the alleged invention.

### **Materials Considered**

22. In forming the opinions that are set forth in this Declaration, I reviewed each of the Asserted Patents, the prosecution histories for each of the Asserted Patents, Blue Spike's Patent Local Rule 3-1 Infringement Contentions, and the parties' Patent Local Rule 4-3 Supplemental Joint Claim Construction and Prehearing Statement and Joint Claim Construction Chart.

### **Opinions & Basis for Opinions**

23. It is my understanding that the four patents-in-suit are part of the same patent family and share a common specification. I also understand that the patents-in-suit generally describe a system and method for monitoring and analyzing signals. This is consistent with the title of each of the Asserted Patents ("Method and Device for Monitoring and Analyzing Signals") as well as the field of their alleged invention. *See* '472 patent at 1:55–59 ("The invention relates to the monitoring and analysis of digital information. A method and device are described which relate to signal recognition to enhance identification and monitoring activities."). The Asserted Patents also state that "[t]he present invention relates to identification of digitally-sampled information, such as images, audio and video." '472 patent at 4:42–43.

24. Despite these disclosures, it is my understanding that Blue Spike claims that the Asserted Patents cover a broad range of fields, including distinct modalities of biometric identification technology such as human fingerprint identification, face recognition, and iris recognition, in addition to the recognition of "images, audio and video" referred to in the Asserted Patents.



25. It is unclear to me how Blue Spike is able to claim that the Asserted Patents cover these fields of biometric identification, given that the Asserted Patents do not mention biometric identification or even cite a single piece of prior art that discloses or is directed to any type of biometric identification. In fact, the Asserted Patents do not mention the words “fingerprint” or “iris” at all—much less disclose the biometric modalities just described. The prosecution histories are equally lacking in this regard. In particular, in examining the prosecution histories for each of the Asserted Patents, I did not see any statement by the patent applicant or the Examiner that the Asserted Patents were ever intended to cover any of the fields of biometric identification.<sup>1</sup>

26. Although I do not agree that the Asserted Patents cover biometric identification technologies, for the purposes of this Declaration I have been asked to make such an assumption so that I can determine whether the term “abstract” is definite. It is my opinion that the term “abstract” is not definite (*i.e.*, the term is indefinite) because it fails to inform, with reasonable certainty, those of ordinary skill in the art about the scope of the alleged invention.

27. In this respect, the term “abstract” appears in each and every asserted claim of the Asserted Patents. Claim 3 of the ’472 patent, which is asserted against the Defendants in this case, presents one example of how the term is used:

A method for monitoring and analyzing at least one signal comprising:

[a] receiving at least one reference signal to be monitored;

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<sup>1</sup> The only mention in the patents-in-suit of anything that a person of ordinary skill in the art of biometric identification would recognize as potentially touching upon this field is the following sentence: “Another useful application involving this type of monitoring and analyzing is the identification of photographs of potential suspects whose identity matches the sketch of a police artist.” ’472 patent at 15:12–15. However, taking a sketch of a human and comparing it to photographs has nothing to do with the biometric modalities of fingerprint, face, and/or iris recognition that I understand Blue Spike to be accusing of infringement in this case.

- [b] creating an **abstract** of said at least one reference signal;
- [c] storing the **abstract** of said at least one reference signal in a reference database;
- [d] receiving at least one query signal to be analyzed;
- [e] creating an **abstract** of said at least one query signal;
- [f] comparing the **abstract** of said at least one query signal to the **abstract** of said at least one reference signal to determine if the **abstract** of said at least one query signal matches the **abstract** of said at least one reference signal;
- [g] creating at least one counter corresponding to one of said at least one reference signals, said at least one counter being representative of the number of times a match is found between the **abstract** of said at least one query signal and the **abstract** of said at least one reference signal; and
- [h] incrementing the counter corresponding to a particular reference signal when a match is found between an **abstract** of said at least one query signal and the **abstract** of the particular reference signal.

28. As one of ordinary skill in the art, I cannot tell what the term “abstract” means with reasonable certainty. In attempting to do so, I have examined the specification common to the Asserted Patents, as well as their prosecution histories. However, these pieces of evidence do not provide a definition or other objective standard for determining the meaning of “abstract.”

29. As a starting point, the Asserted Patents do not provide any definition or explanation of the term “abstract.” There are no disclosures in the specification or prosecution histories that define this claim term so that it could be understood by one of ordinary skill in the art. There are also no figures in the Asserted Patents that illustrate the alleged invention—much less the meaning of the term “abstract.”

30. The Asserted Patents also do not provide any explanation as to how an “abstract” is generated or created. Again, the Asserted Patents do not provide any figures that illustrate

how this process could be accomplished. There are also no algorithms or other methodologies disclosed in the Asserted Patents that explain how “abstracts” are created, either with respect to signal processing in general or with respect to the biometric modalities that Blue Spike has accused of infringement.

31. The Asserted Patents also do not provide any explanation as to how an “abstract” is compared against other “abstracts.” There are simply no disclosures, figures, algorithms, and/or methodologies in the specification or prosecution histories that explain how the process of comparing an “abstract” with other “abstracts” is accomplished.

32. Because the Asserted Patents fail to provide any disclosure or explanation that answers these fundamental questions (*i.e.*, What is an “abstract”? How is an “abstract” generated or created? And, how is an “abstract” compared against other “abstracts?”), one of ordinary skill in the art would not and cannot understand the meaning of the term “abstract” with reasonable certainty. As a result, it is my conclusion that the asserted claims from the patents-in-suit are invalid as indefinite, because when read in light of the specification and prosecution histories, they fail to inform, with reasonable certainty, one of ordinary skill in the art about the scope of the alleged invention.

33. Instead of providing any disclosure that would allow one of ordinary skill in the art to understand the meaning of the term “abstract,” I note that the specification to the Asserted Patents generically states: “the abstract of a signal may be generated by the following steps:

1) analyze the characteristics of each signal in a group of audible/ perceptible variations for the same signal (e.g., analyze each of five versions of the same song—which versions may have the same lyrics and music but which are sung by different artists); and 2) select those characteristics which achieve remain relatively constant (or in other words, which have minimum variation) for

each of the signals in the group.” *See, e.g.*, ’472 patent at 3:63-4:4. These generic steps, however, do not inform one of ordinary skill in the art about what an “abstract” is or how it is created. In fact, a person of ordinary skill in the art of signal processing who read the foregoing description and its provided example would not be provided with any guidance as to what an “abstract” looks like or how it should be created. Moreover, a person of ordinary skill in the art of biometric identification who read the foregoing description and its provided example would be certain that this description did not and could not apply to biometric identification.

34. Other disclosures in the specification relating to “abstract” are similarly vague: “a ‘signal abstract’ which naturally, or by agreement with the creator, the copyright owner or other interested parties, can be used to describe the original signal.” ’472 patent at 9:56-59. “The present invention concerns itself with perceptible relationships only to the extent that efficiencies can be achieved both in accuracy and speed with enabling logical relationships between an original signal and its abstract.” *Id.* at 9:42-46. “As long as a realistic set of conditions can be arrived at governing the relationship between a signal and its data reduced abstract, increases in effective monitoring and transparency of information data flow across communications channels is likely to result.” *Id.* at 9:61-65.

35. These vague disclosures also fail to apprise one of ordinary skill in the art with reasonable certainty about the meaning of “abstract.” And, beyond that lack of reasonable certainty, the specification also does not explain how the term “abstract” relates to the art of signal processing or even biometric identification. In this respect, the intrinsic record fails to explain to one of ordinary skill in the art exactly what could reasonably qualify as an “abstract”—either in the fields of signal processing or biometric identification.

36. In fact, the only thing I was able to determine about an “abstract” from the Asserted Patents and their accompanying file histories is that an “abstract” does not contain an “additive monitoring signal,” such as a watermark. *See, e.g.*, ‘472 patent at 5:18-20. However, this limited understanding falls well short of explaining what an “abstract” actually is, and does not apprise one of ordinary skill in the art about the scope of the alleged invention with reasonable certainty. Accordingly, one of ordinary skill in the art would have to use his or her subjective opinion to ultimately determine what meaning to apply to the term “abstract.”

37. I also note that, as one of skill in the art of signal processing and biometric identification at the time of the filing of the patents, the term “abstract” was not broadly known as a term of art in either of these fields.

38. The fact that the Asserted Patents and their accompanying file histories fail to provide reasonable certainty about the meaning of the term “abstract” is particularly significant when one considers that in the field of signal processing, there were numerous ways to analyze a signal by the time of the alleged invention (in fact, research in the field of signal processing largely deals with these many methods and related issues).

39. The same is also true within the field of biometric identification. In fact, the accused biometric modalities—fingerprint, face, and iris—each involved highly complex procedures requiring specialized techniques that were developed over decades and were well-known for many years before the alleged invention of the patents-in-suit (September 7, 2000).

40. Each of the accused biometric modalities involves the examination of different biological features and characteristics, and thus requires different, highly sophisticated algorithms for analyzing and comparing these features and characteristics. Furthermore, prior to the alleged invention of the Asserted Patents, each of these biometric modalities had

accumulated its own body of knowledge, scholarly work, and prior art—none of which is mentioned or disclosed in the Asserted Patents (see, as examples, U.S. Patent No. 5,291,560 to Daugman (iris recognition); U.S. Patent No. 6,111,517 to Atick (facial recognition); U.S. Patent No. 4,790,564 to Larcher (fingerprint identification)). Indeed, if the patents-in-suit had actually claimed to cover any of these biometric modalities (*e.g.*, face, fingerprint, or iris recognition) at the time they were filed, I cannot see how the patents-in-suit could have possibly been granted.

41. For all of the reasons listed above, it is my opinion that the term “abstract” is indefinite, and as a result, the asserted claims from the patents-in-suit are invalid.

I declare under the penalty of perjury under the laws of the United States of America that the foregoing is true and correct, and that this Declaration was executed on September 8, 2014.

A handwritten signature in black ink that reads "Kevin W Bowyer". The signature is written in a cursive, flowing style.

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Kevin W. Bowyer, Ph.D.